

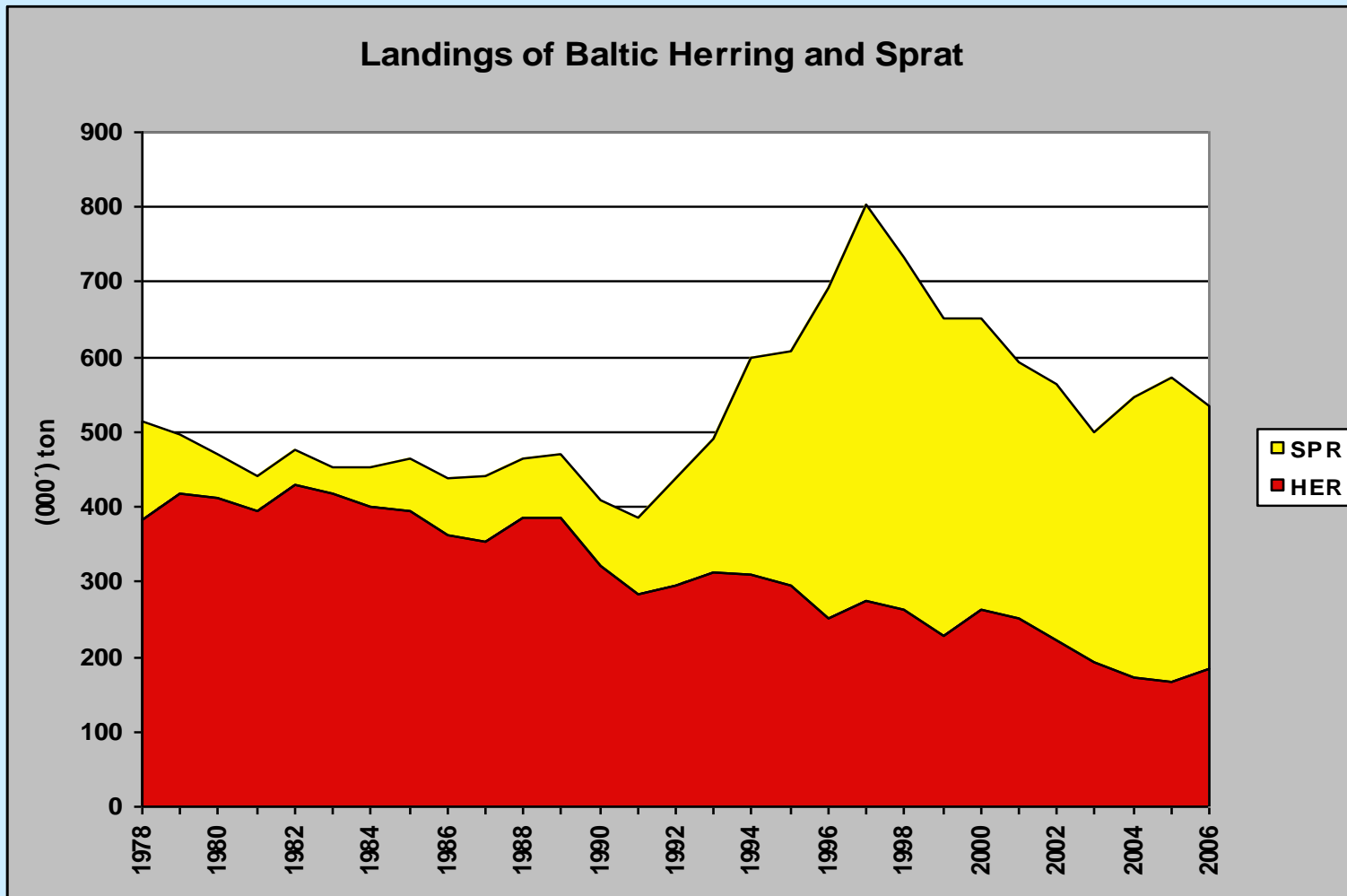
Herring fishery in the North-Eastern Baltic Sea: gear and stock effects



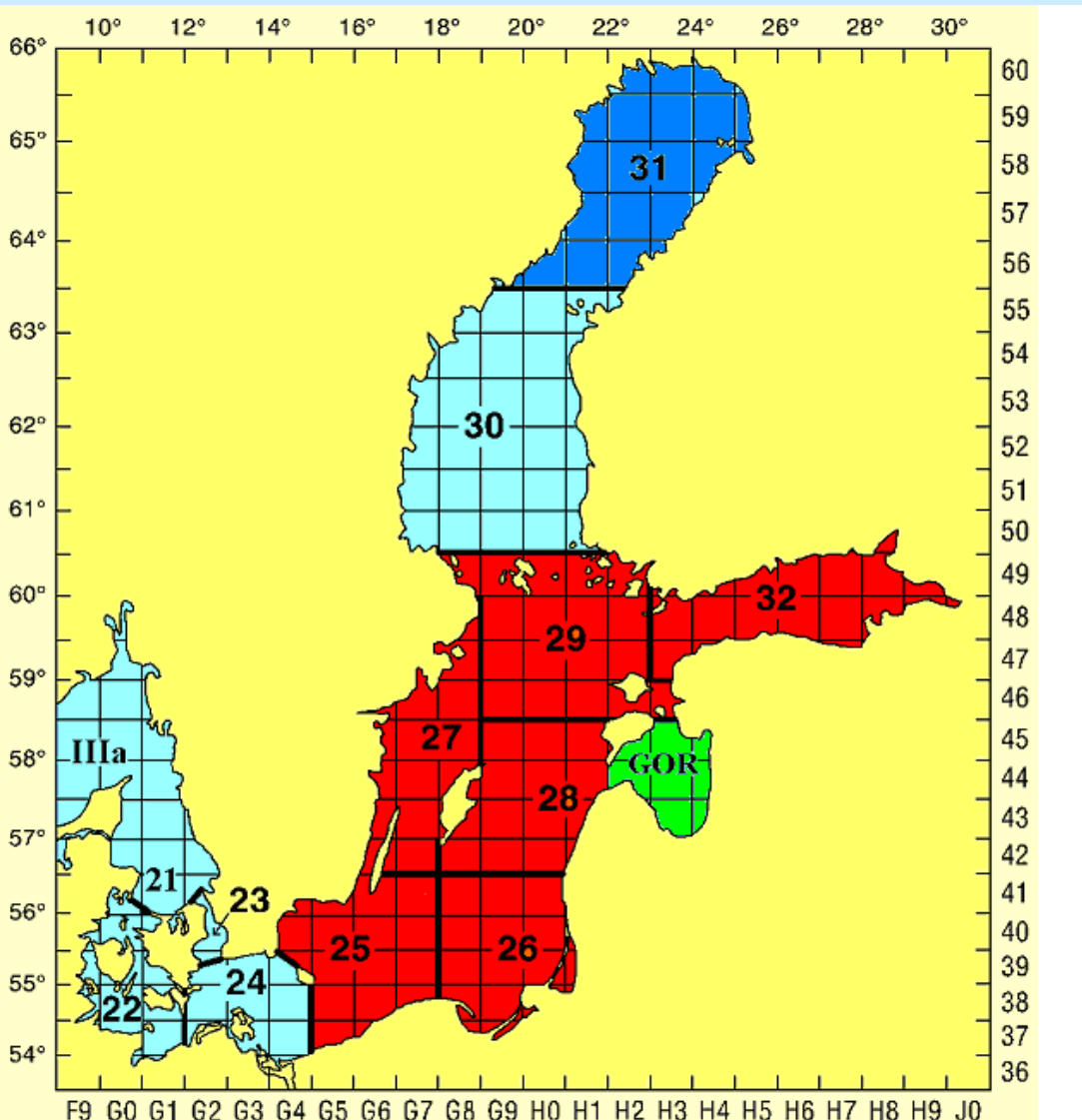
Tiit Raid
Estonian Marine Institute
University of Tartu

Baltic pelagic landings

- Total landings of pelagics have increased
- Sprat has been dominating since mid-1990s

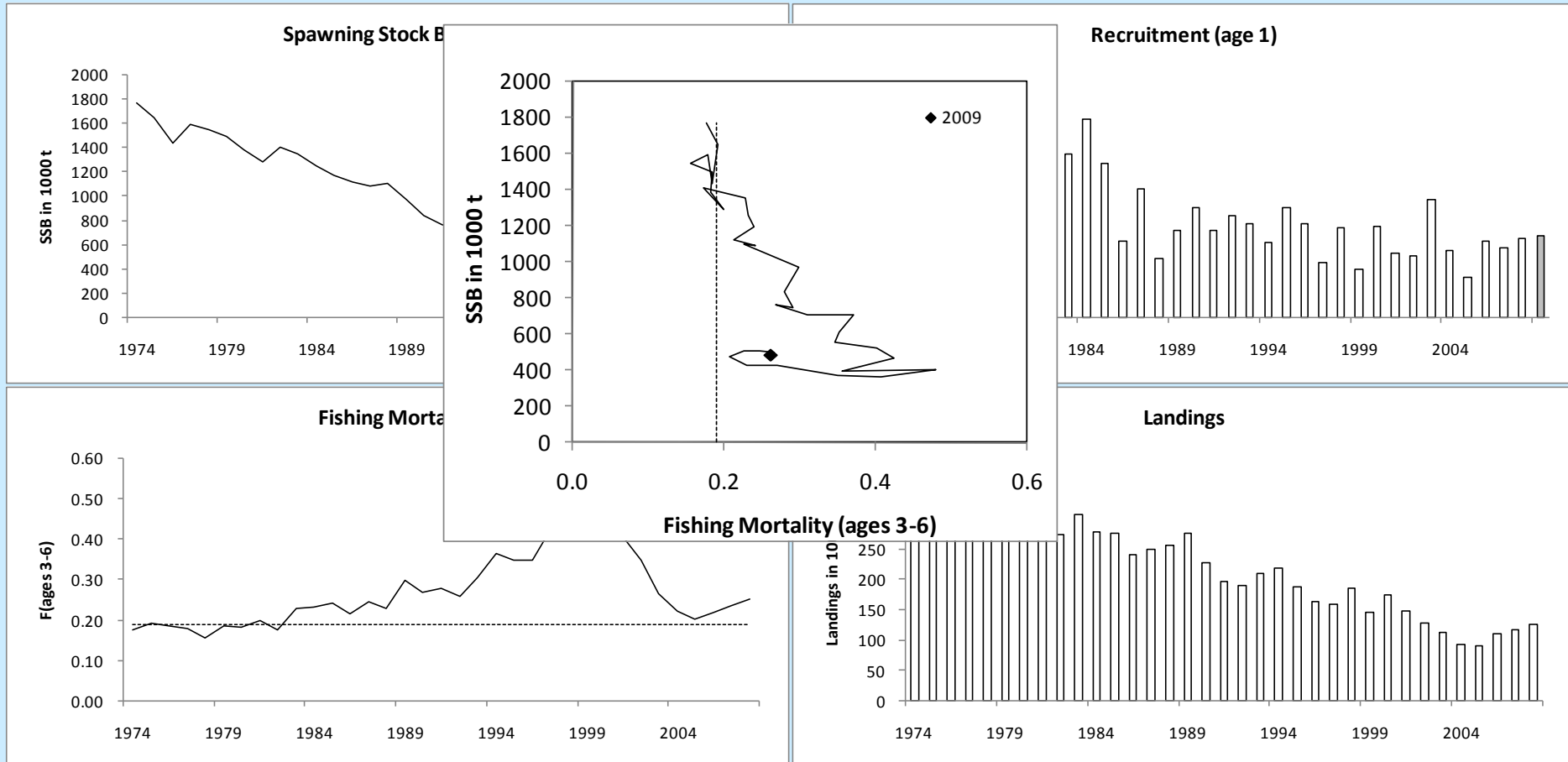


Herring stocks (assessment units)



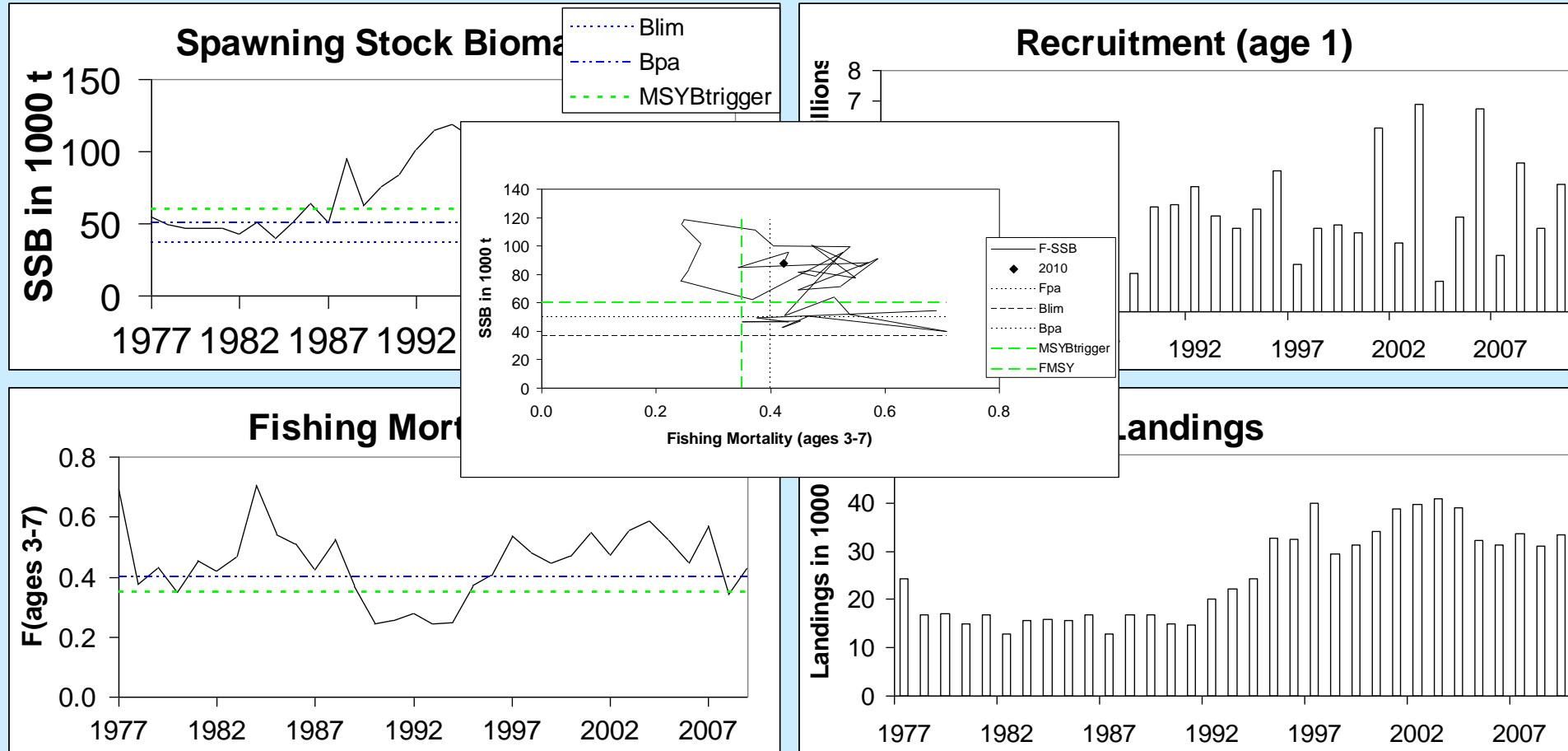
- Central Baltic herring SD 25-29&32
- Gulf of Riga SD 28.1
- Bothnian Sea SD 30
- Bothnian Bay SD 31

Stock status: Central Baltic Herring



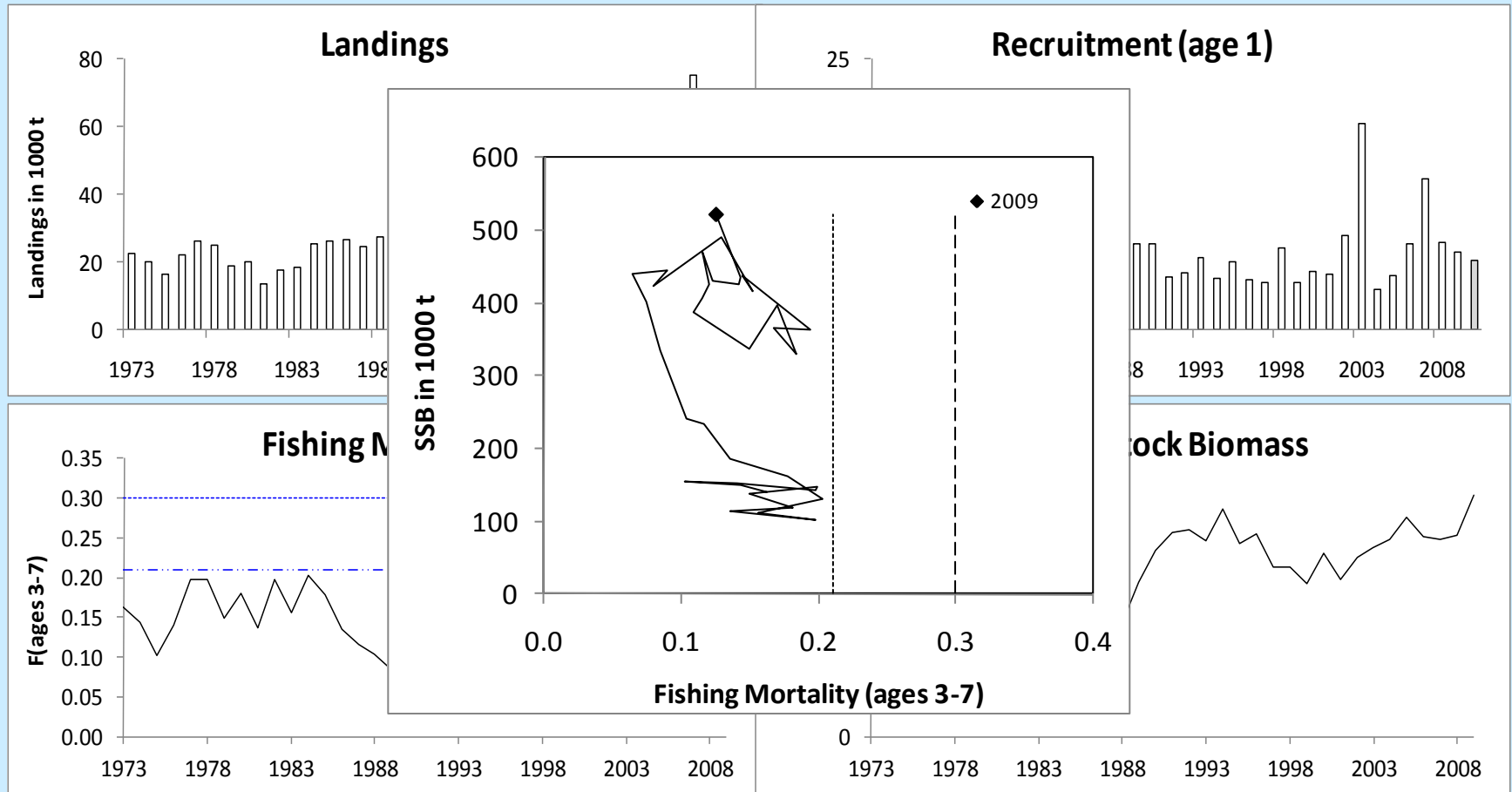
F has been above FPA for most of assessment history

Stock status: Gulf of Riga Herring



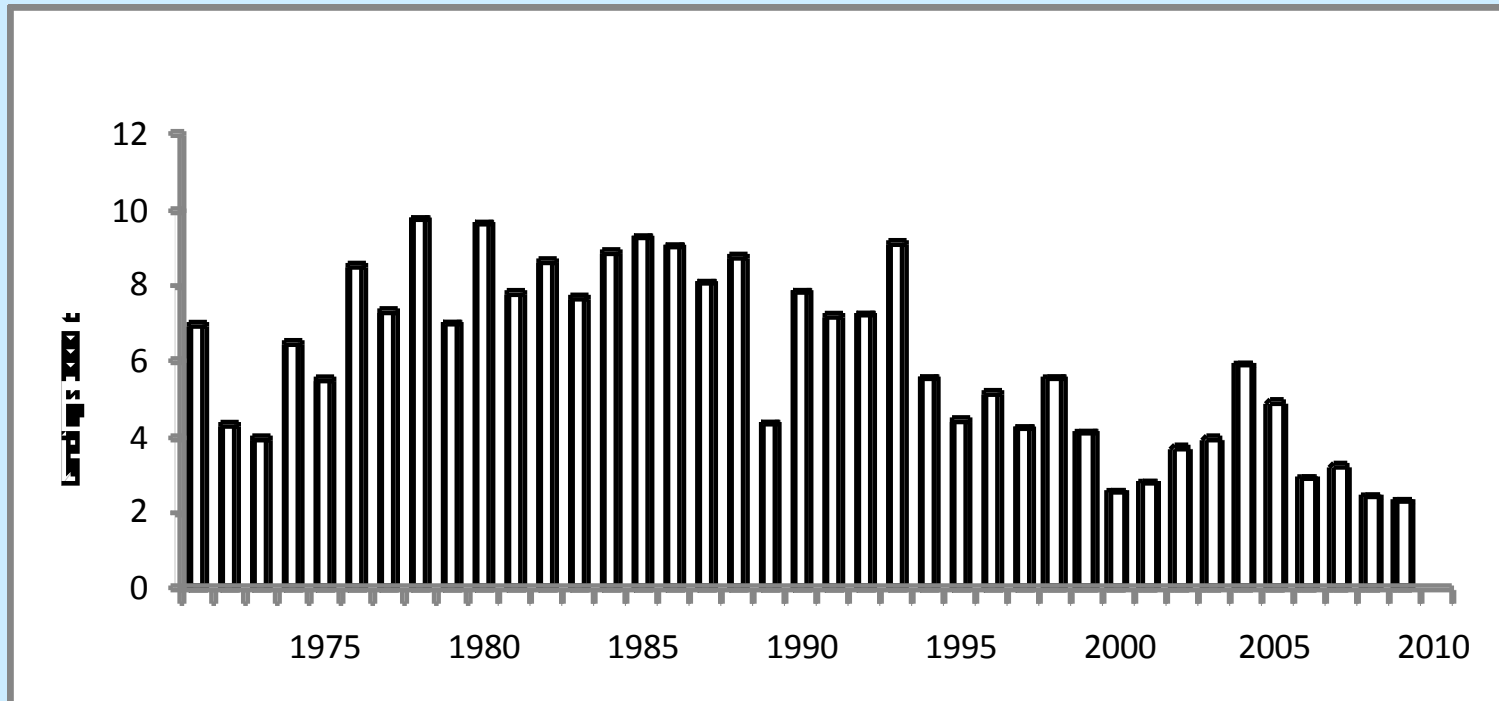
Based on the most recent estimates of fishing mortality, ICES classifies the stock as being harvested unsustainably.

Stock status: Bothnian Sea (SD 30) herring



The only sustainably harvested herring stock

Stock status: Bothnian Bay (SD 31) herring



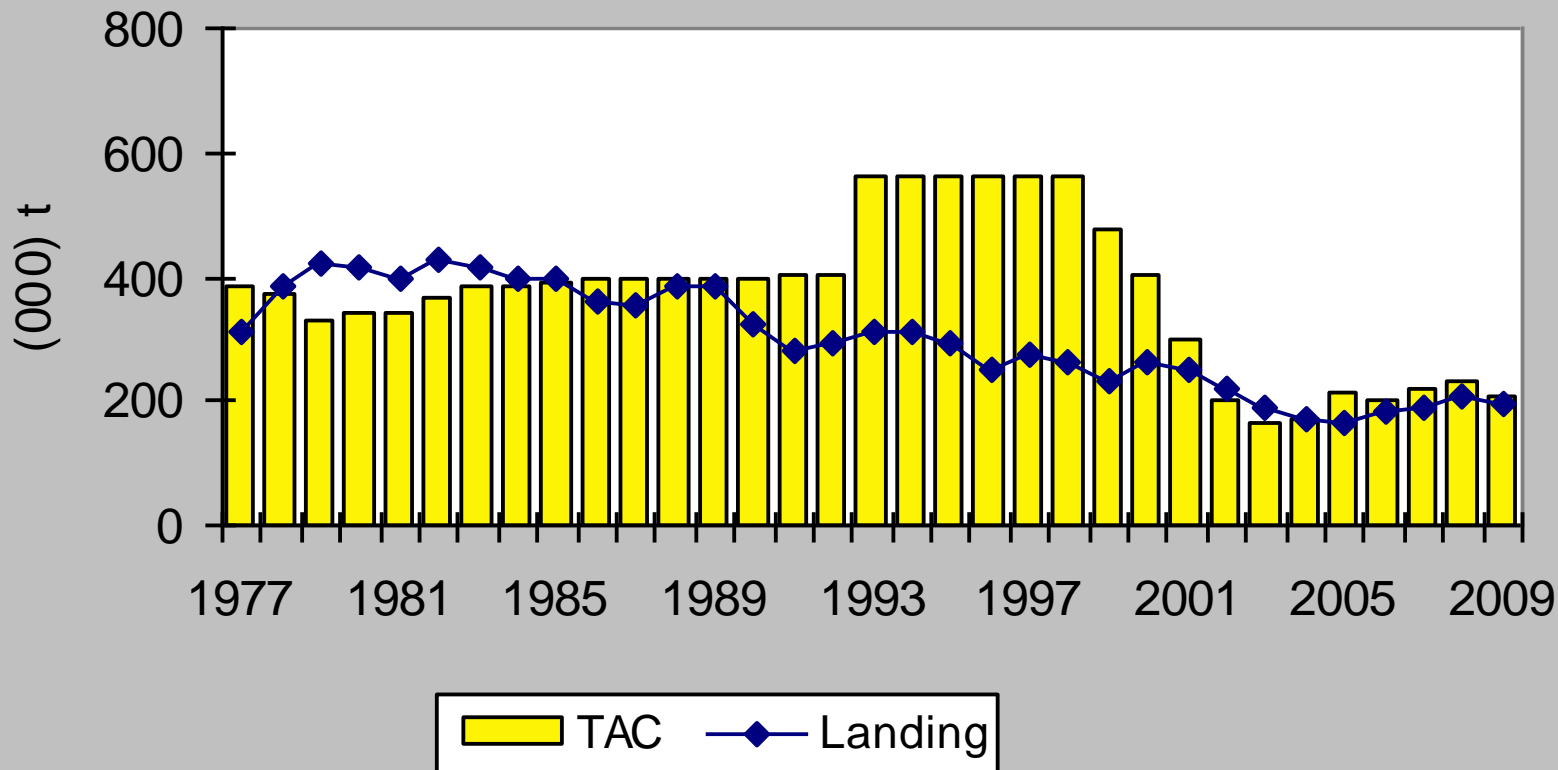
The available information is inadequate to evaluate stock trends. Therefore the state of the stock is unknown and there is no basis for an advice.

What kind of management tools are available?

- TAC
- Technical measures
 - Closed areas
 - Closed seasons
 - Gear restrictions

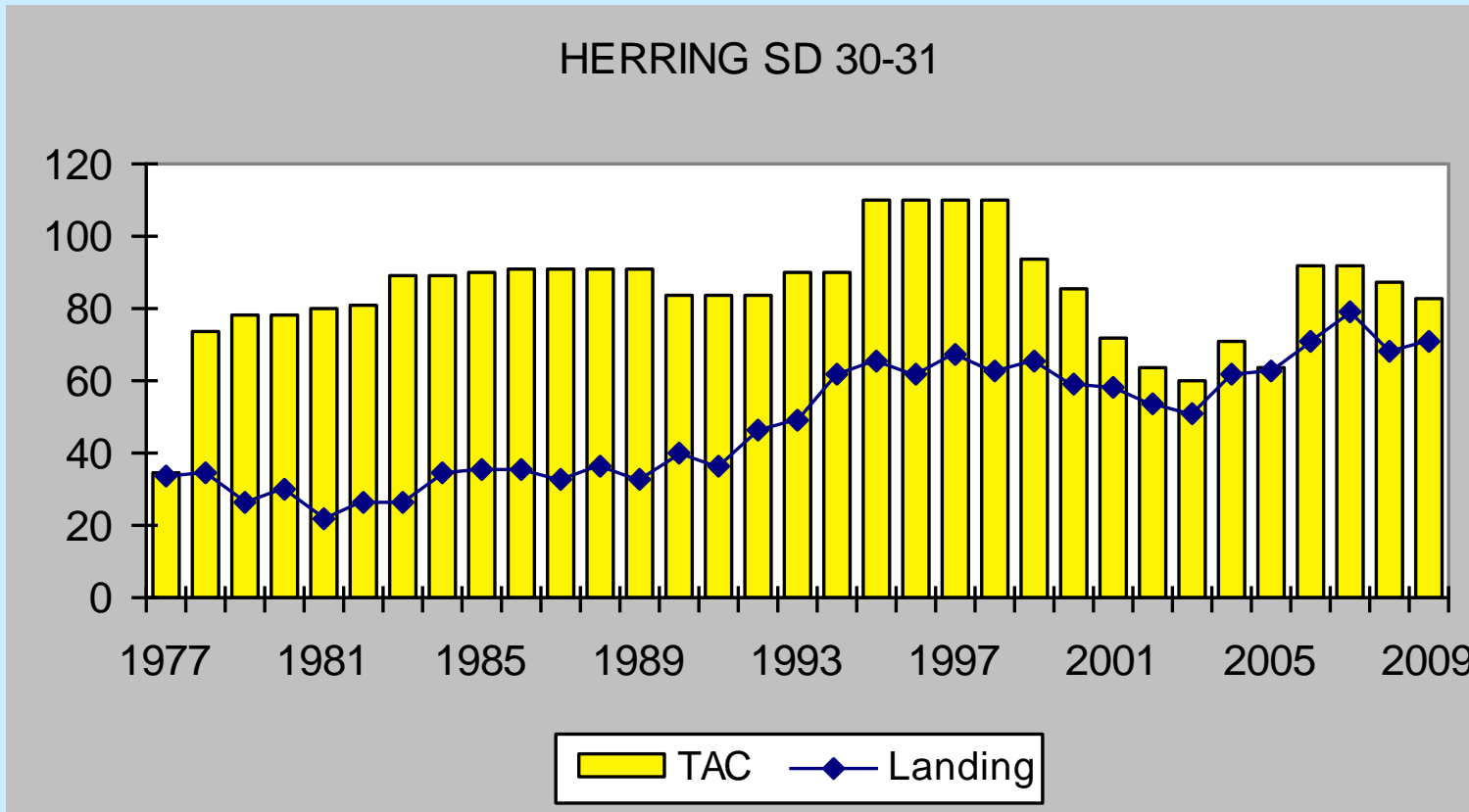
Herring TAC and landings in the Baltic Sea 1977-2009 (ICES)

HERRING SD 22-29,32



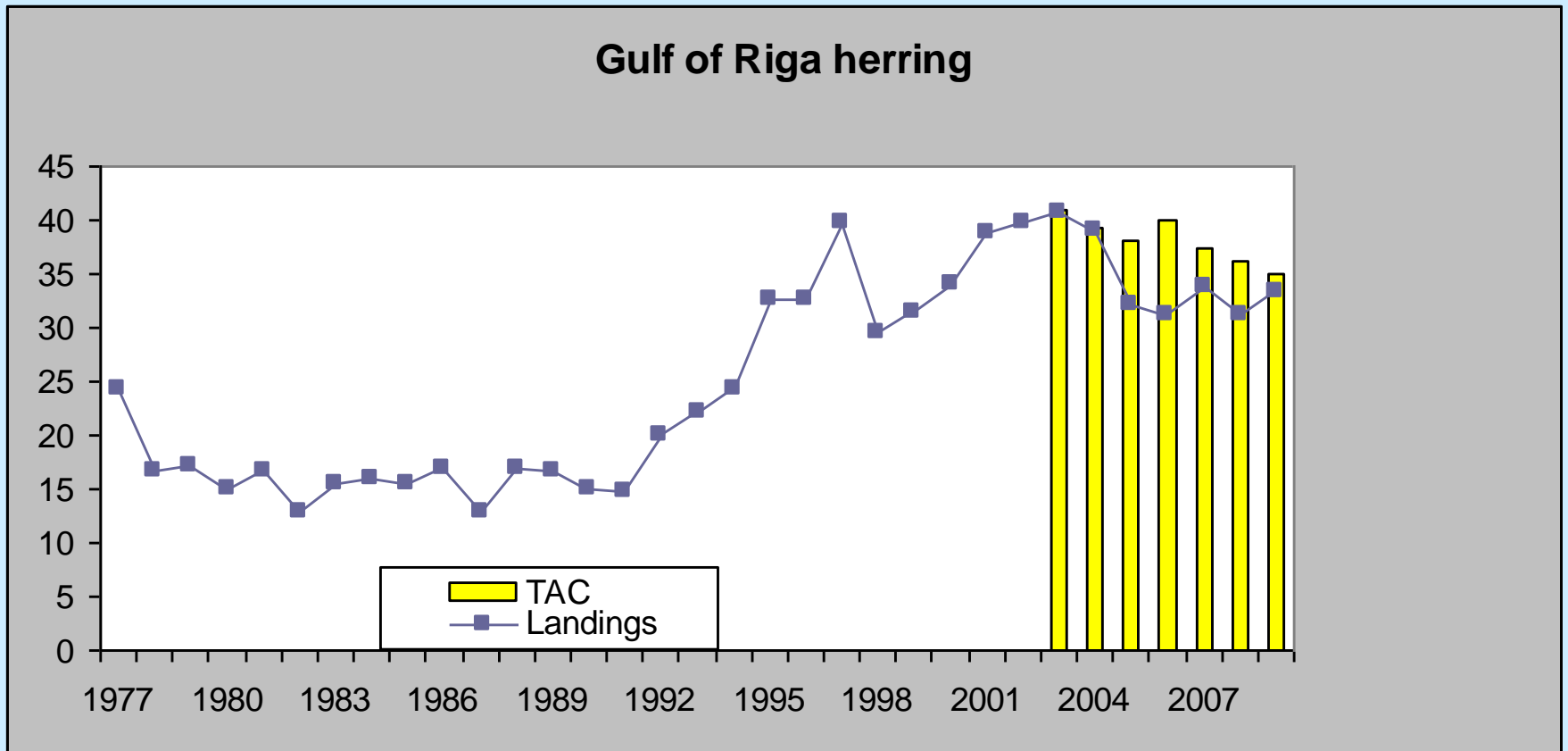
- Up to 2000s – no effect of TAC on landings
- TAC has been restrictive since 2002

Herring TAC and landings in the Baltic Sea 1977-2009 in SD 30 & 31 (ICES)



TAC never has been restrictive

Herring TAC and landings for the Gulf of Riga herring (ICES)



TAC since 2003: mostly has not been restrictive

General problem with herring management:

Too high F , despite of TAC
regulation

What has been wrong- Advice?

-TAC?

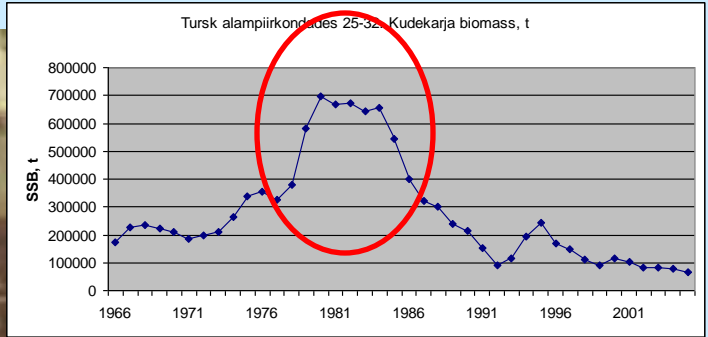
... Even good advice does not
necessarily yield an adequate TAC!!!

Still, only good assessment makes a good advice...

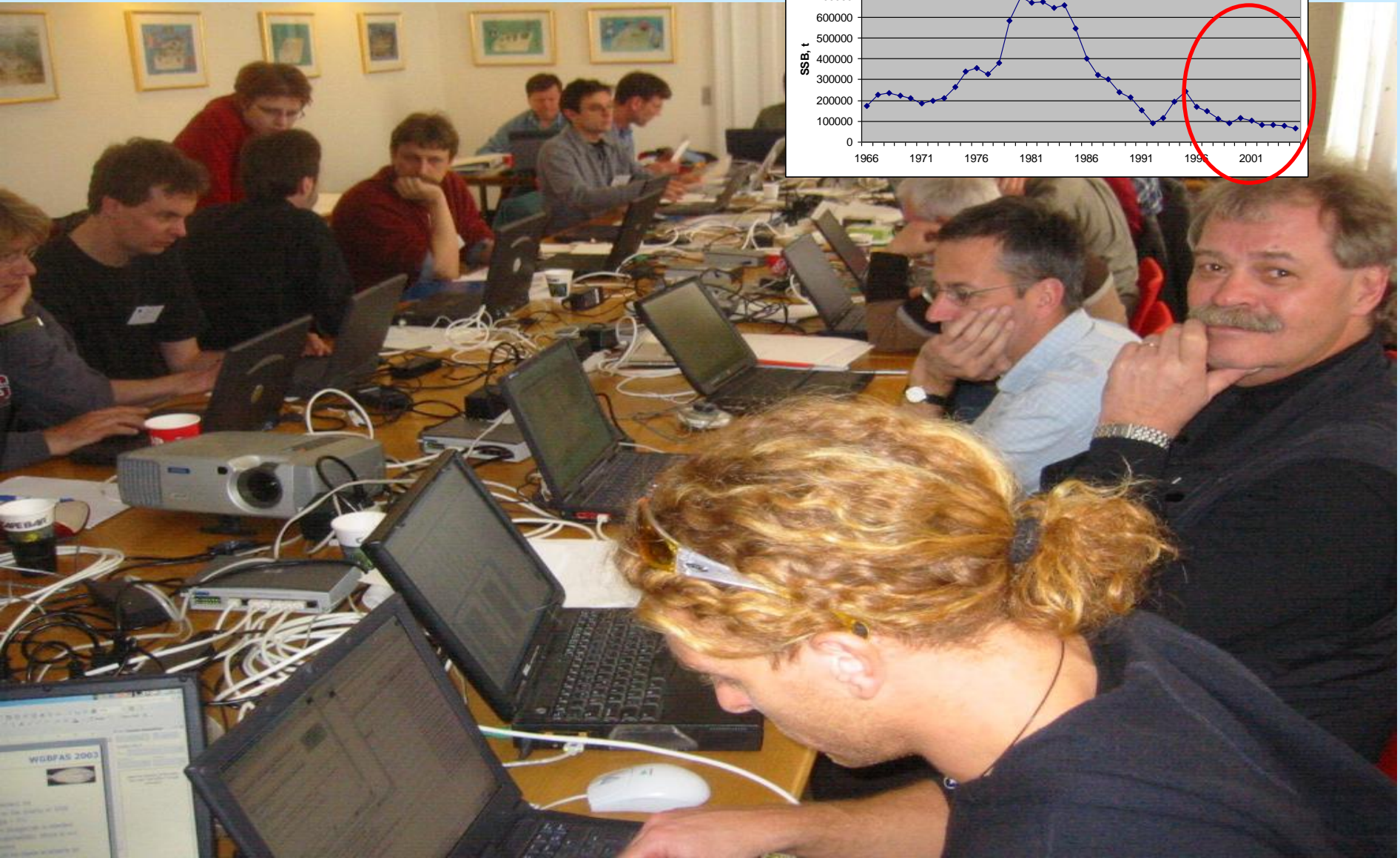
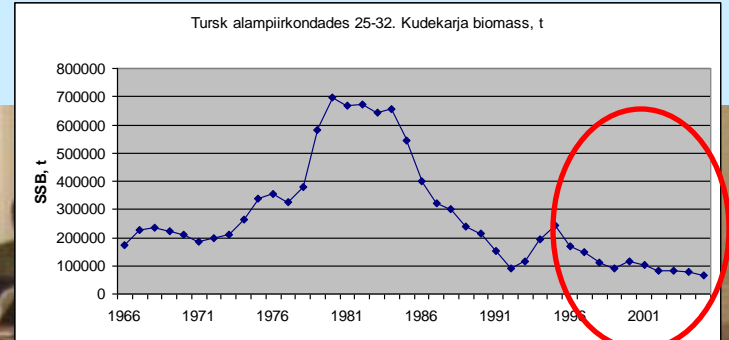
Key problems in assessment process

- Catch/landings statistics ← EU DCF
- Adequate data collection
- Comprehensive assessment methods ← ICES

ICES Baltic Demersal WG in 1983

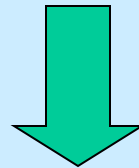
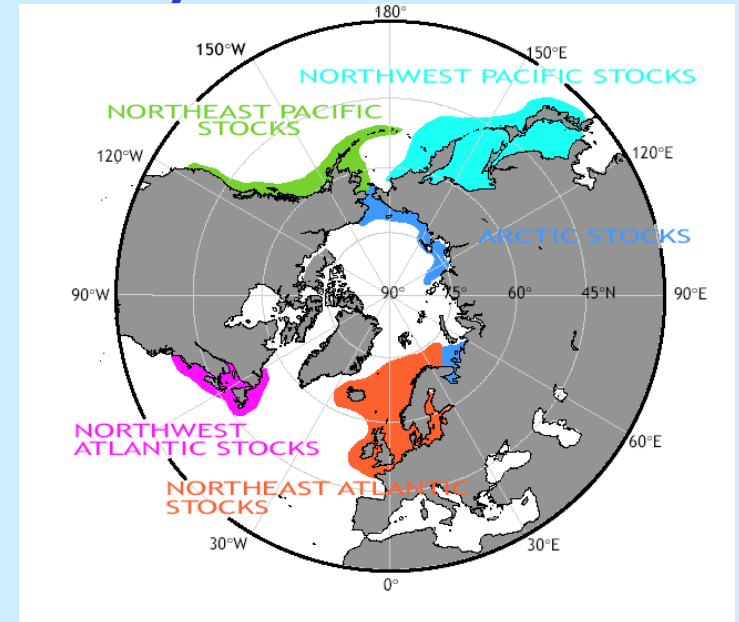


ICES WGBFAS 2002.a.



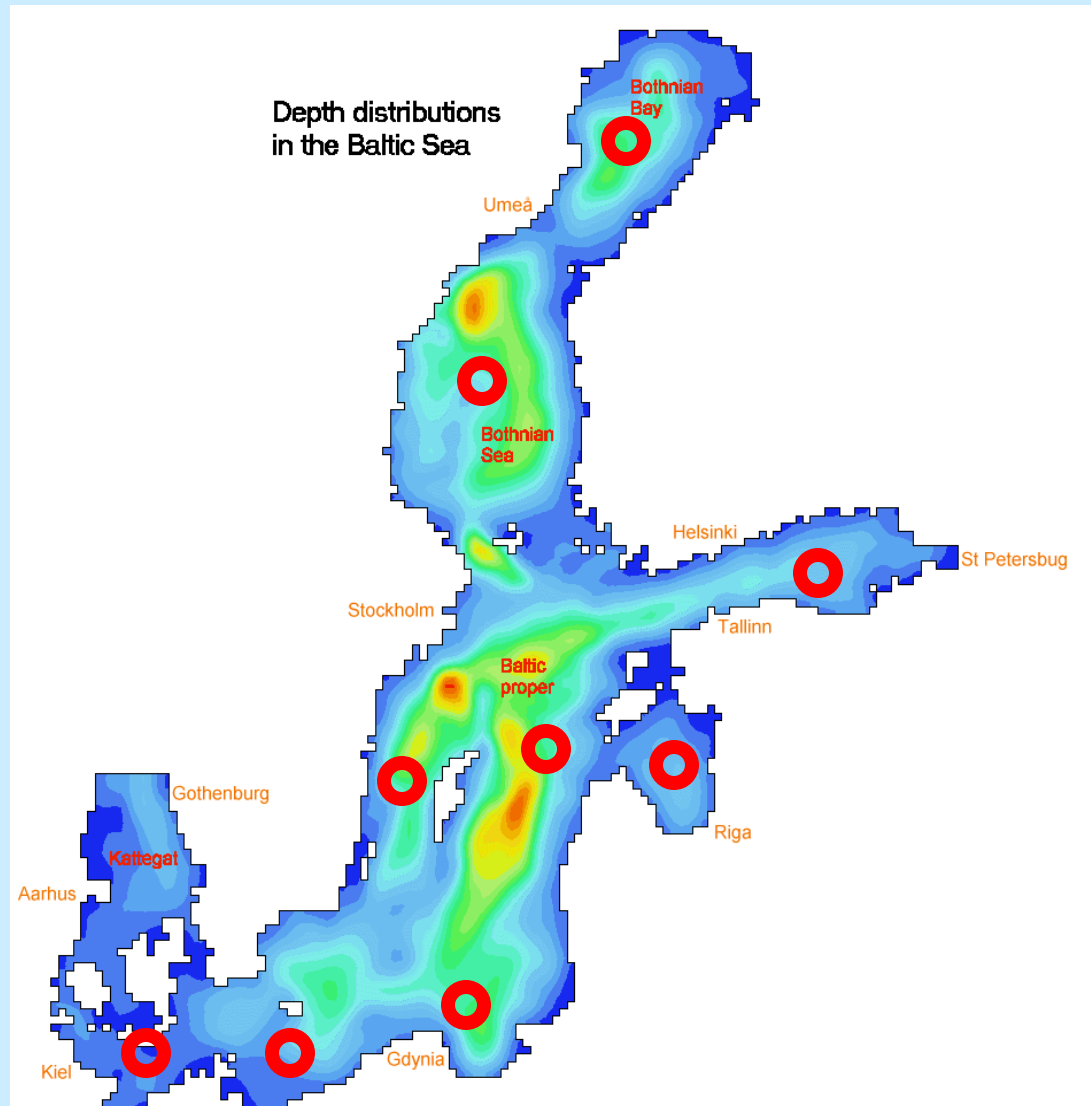
STOCK EFFECT

Universal for herrings: Spatial heterogeneity

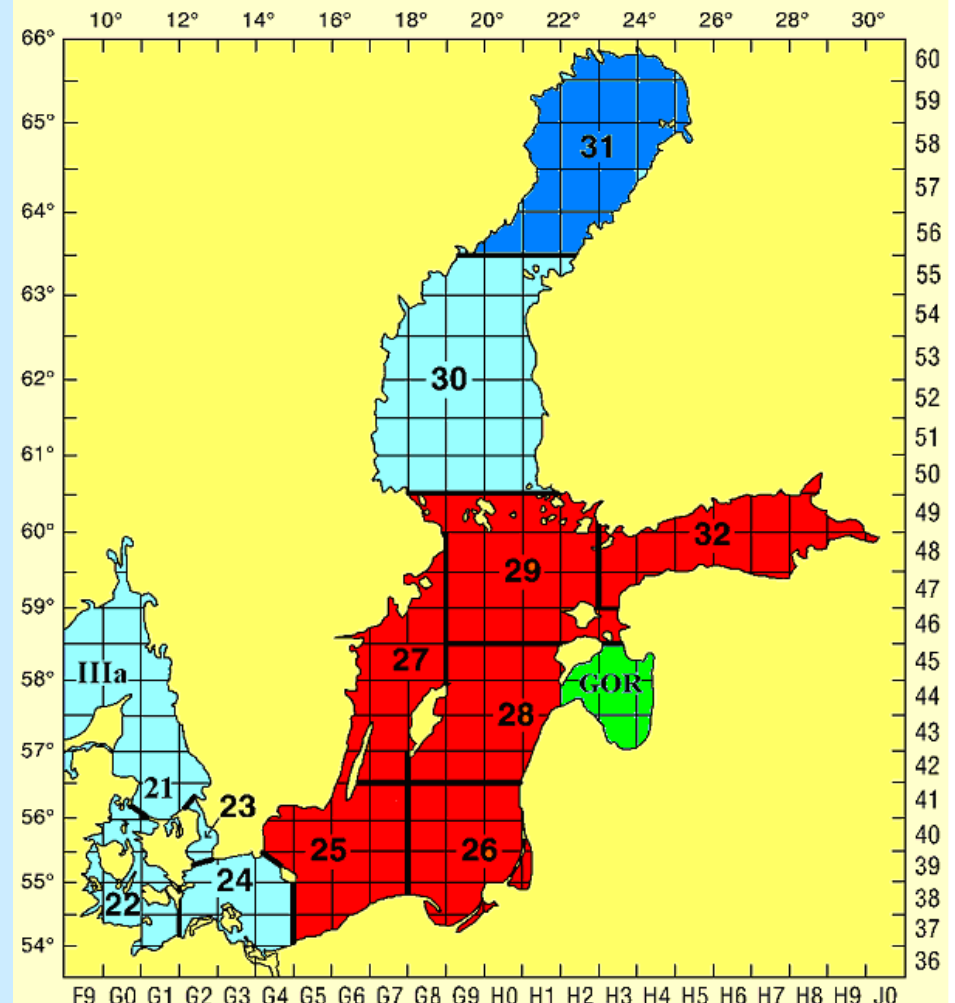
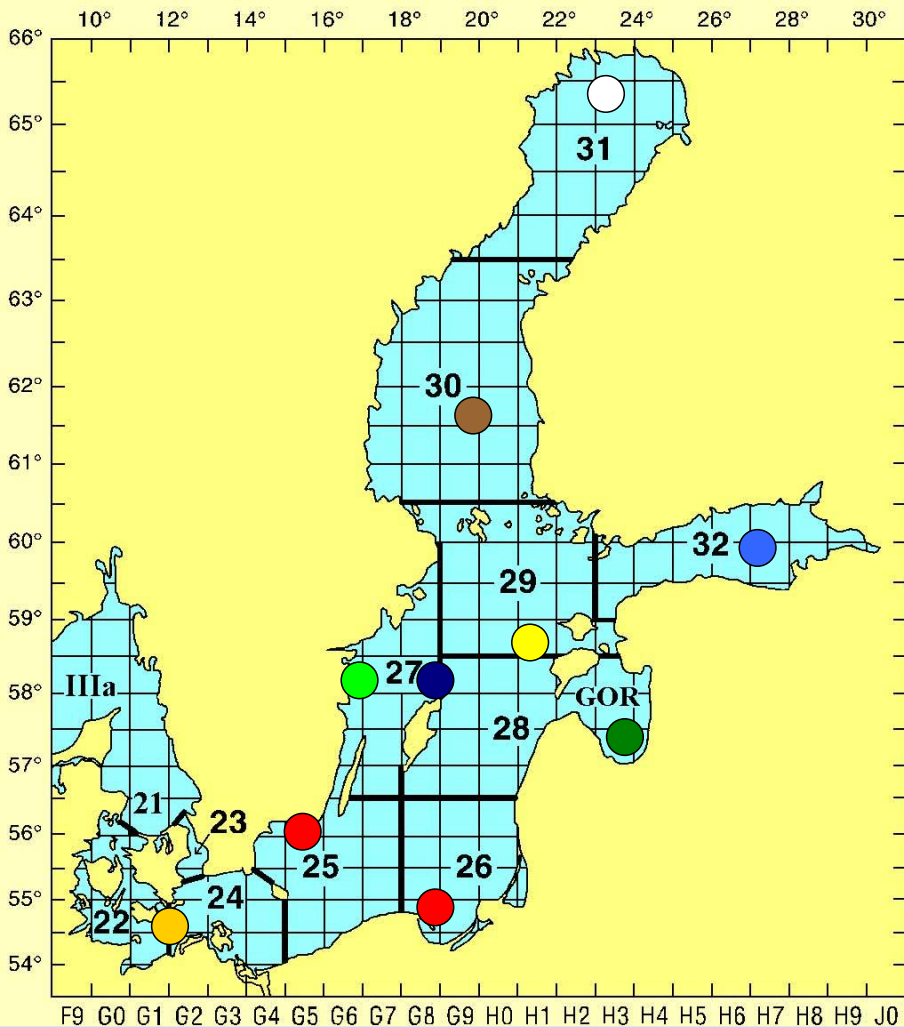


- Processes and dynamics can be and different in different populations
- Data collection – do we cover population(s) adequately?

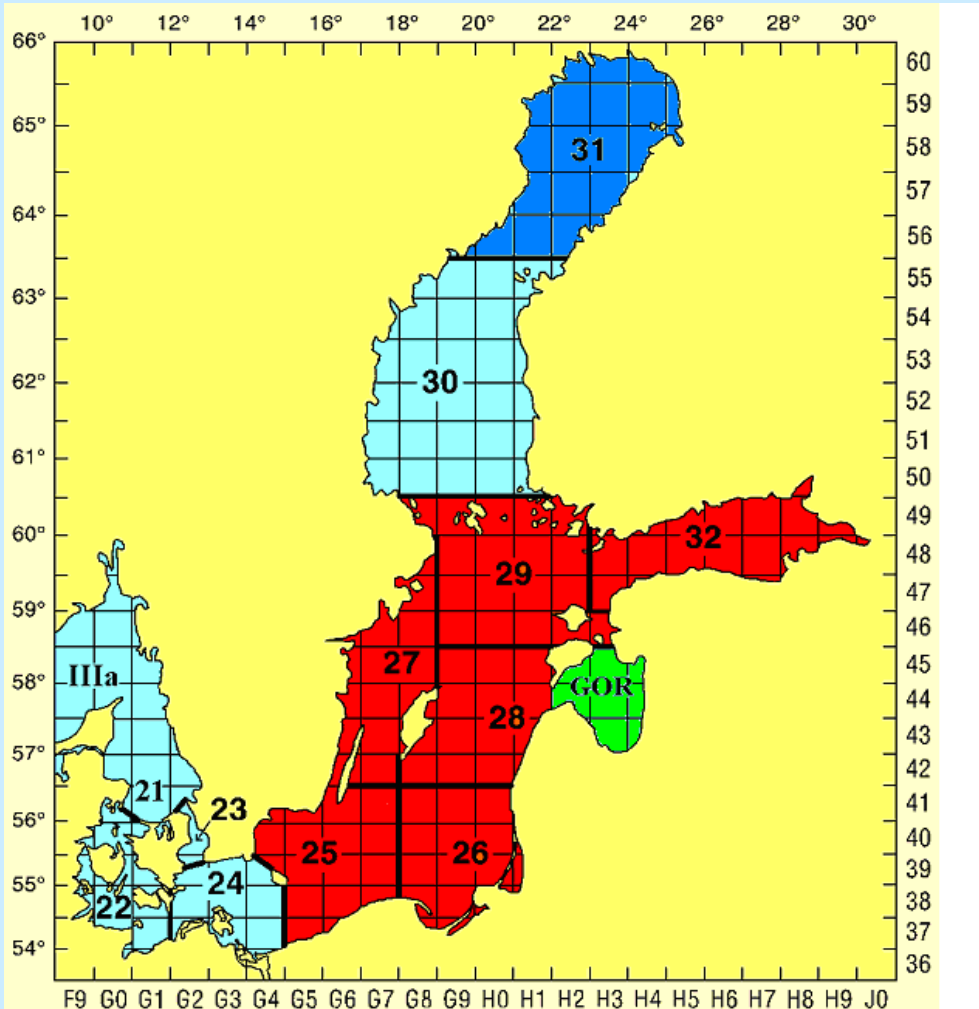
Herring populations in the Baltic Sea (Ojaveer, 1991)



Local populations vs assessment units



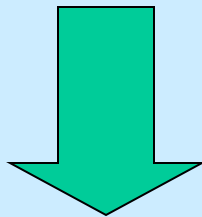
Herring stocks (assessment units) and management units



- Central Baltic herring AU+ MU
- Gulf of Riga AU+MU
- Bothnian Sea AU+MU
- Bothnian Bay AU

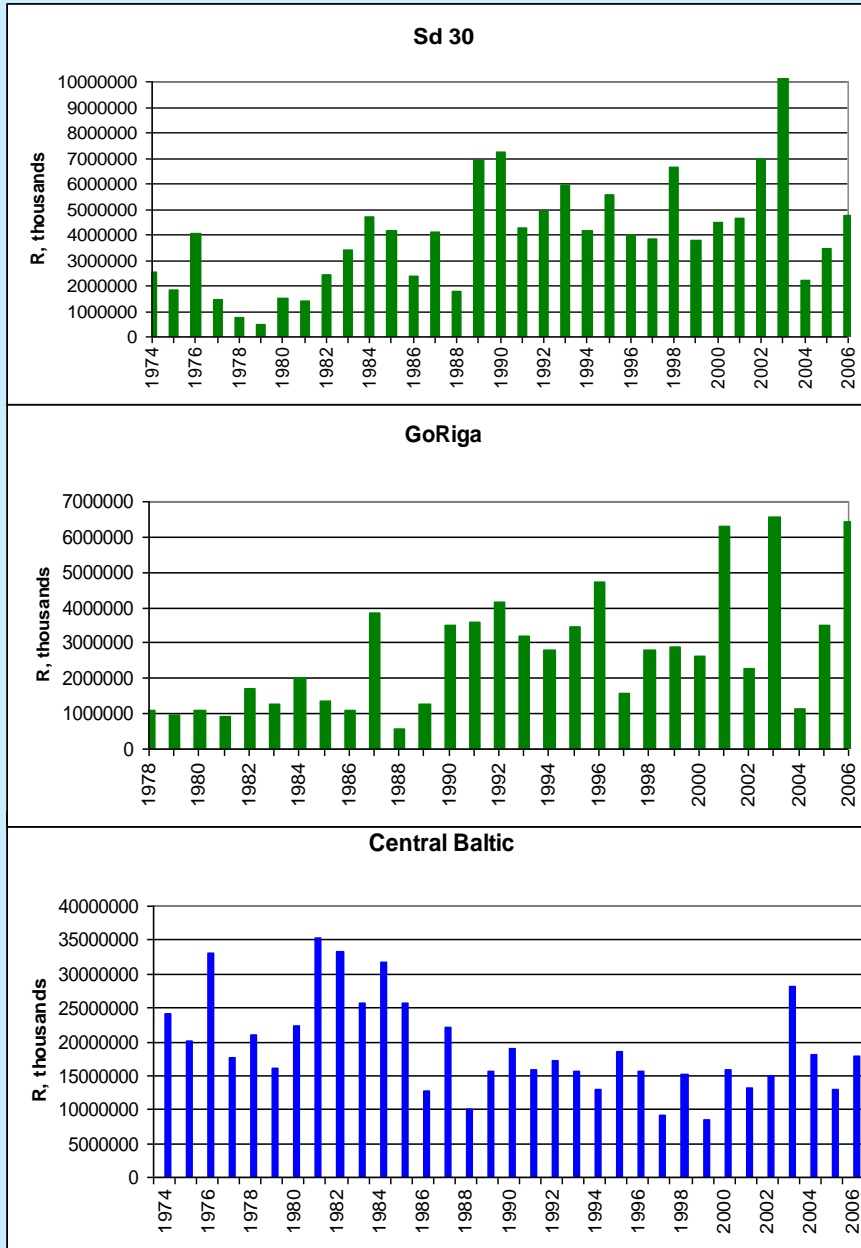
2 types of baltic herring populatons (stocks)

- Open sea stocks → open sea
coasts + gulfs
- Gulf stocks → gulfs only



**Different environmental conditions during recruitment
formation and growth**

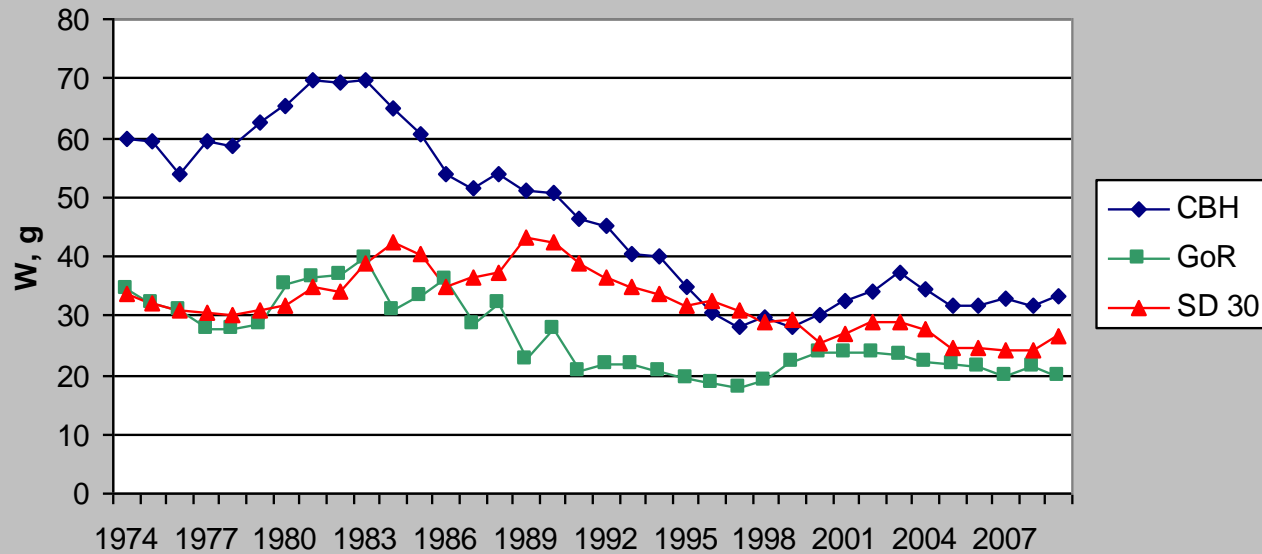
CBH and gulf stocks show opposite trends in R (ICES WG data)



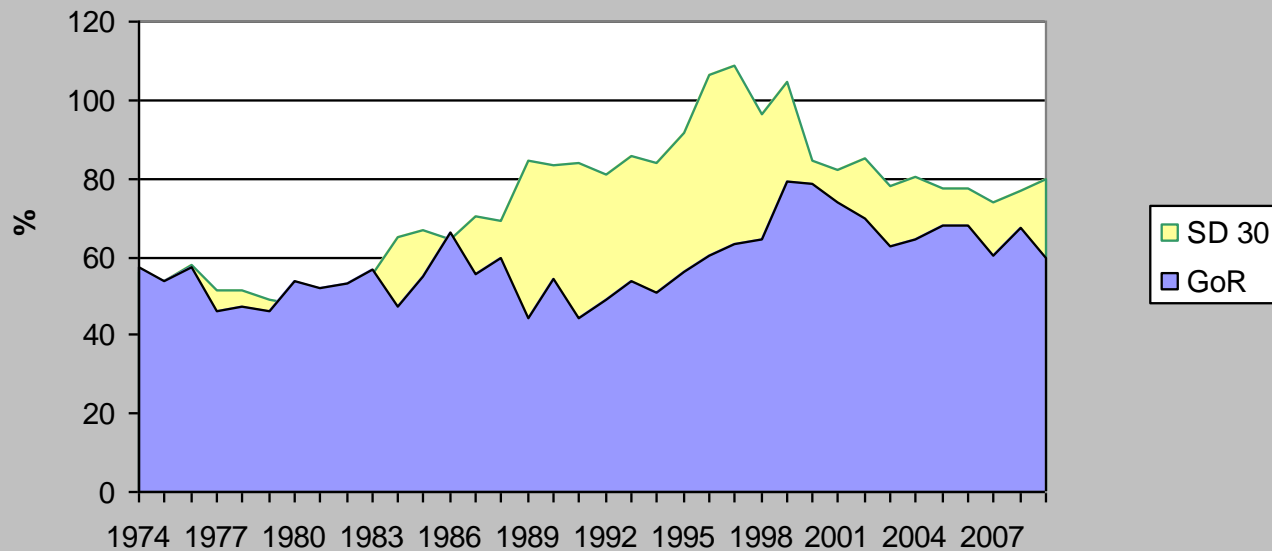
**Gulf stocks:
increase**

**Open sea
stocks:
decrease or
stable**

Mean weight at ages 3-6



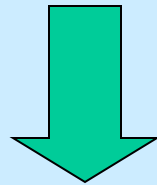
- Weights in GoR and Sd 30 have been 50-80% of weights in CBH



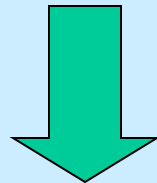
- Weight differences have been lower in the most recent period

This means:

Taking the same amount of fish in weight (TAC) results in different losses in abundance

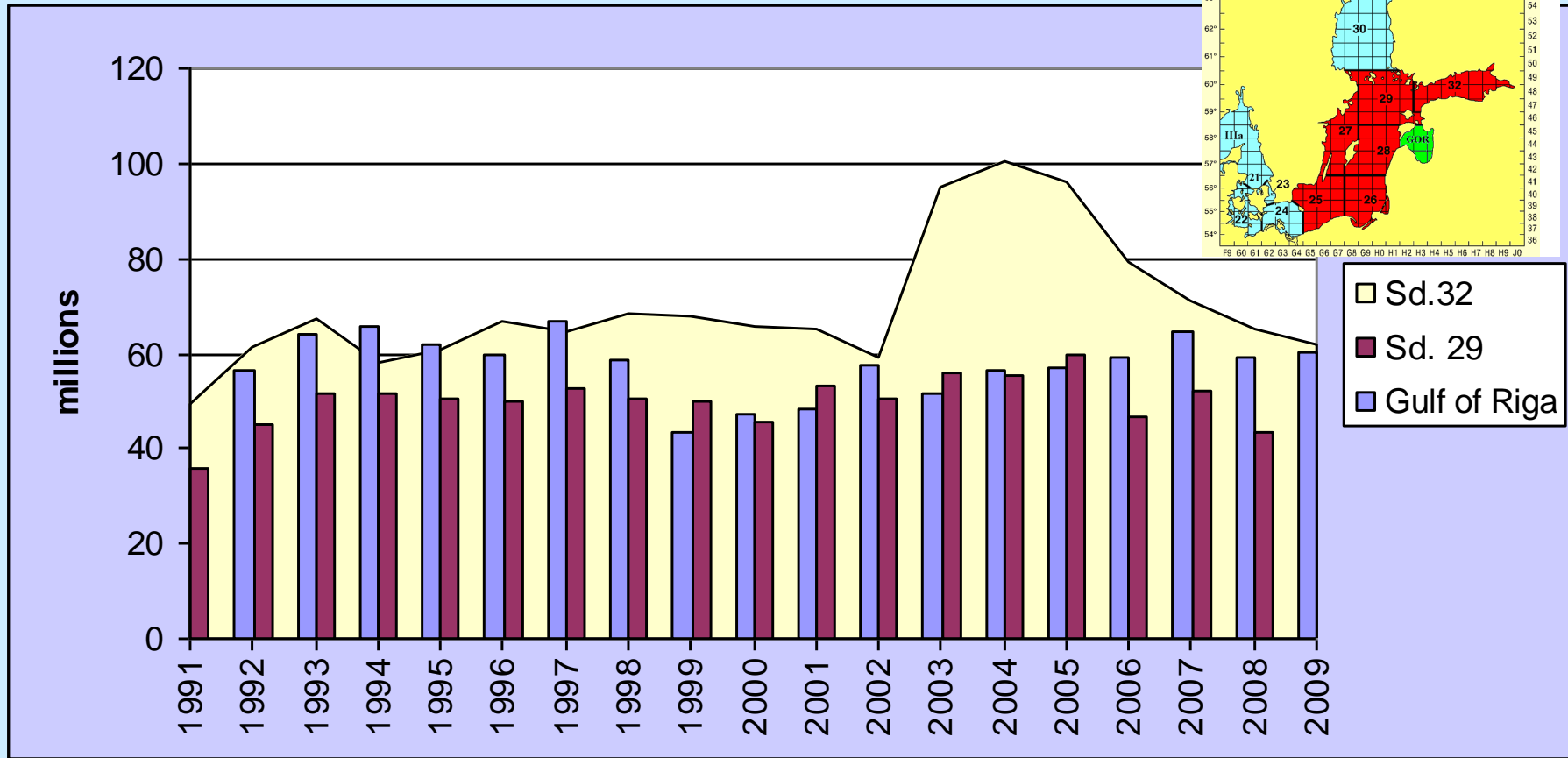


Different F



In case of combined stocks (CBH): The effect of fishery can be different in different sub-stocks

Number of herring necessary to catch in order to get 1000t of landings in Sd 29 and 32 (CBH) and in Gulf of Riga

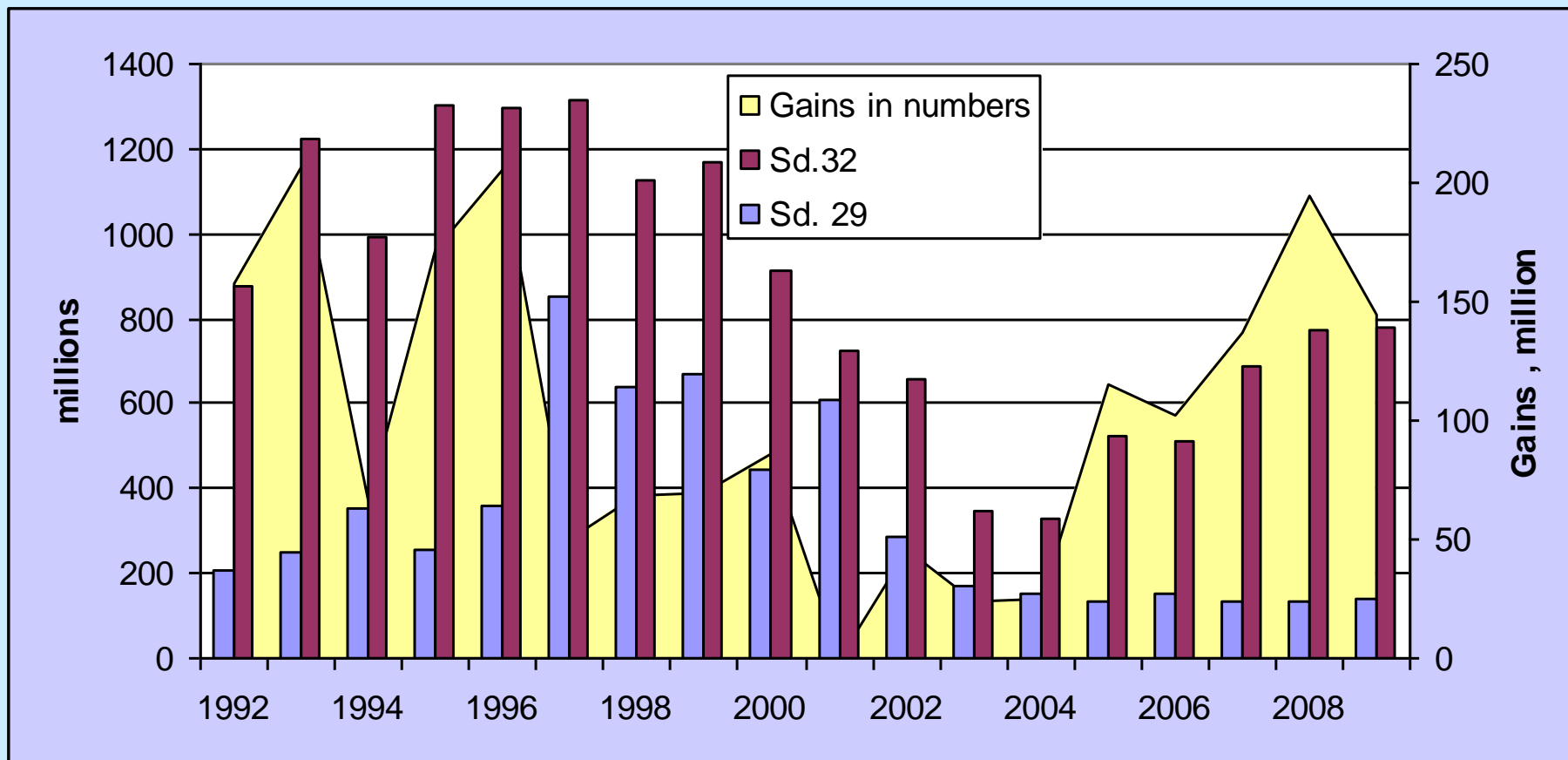


On average: SD 29- 50 million

Gulf of Riga- 58 million

Sd 32- 70 million

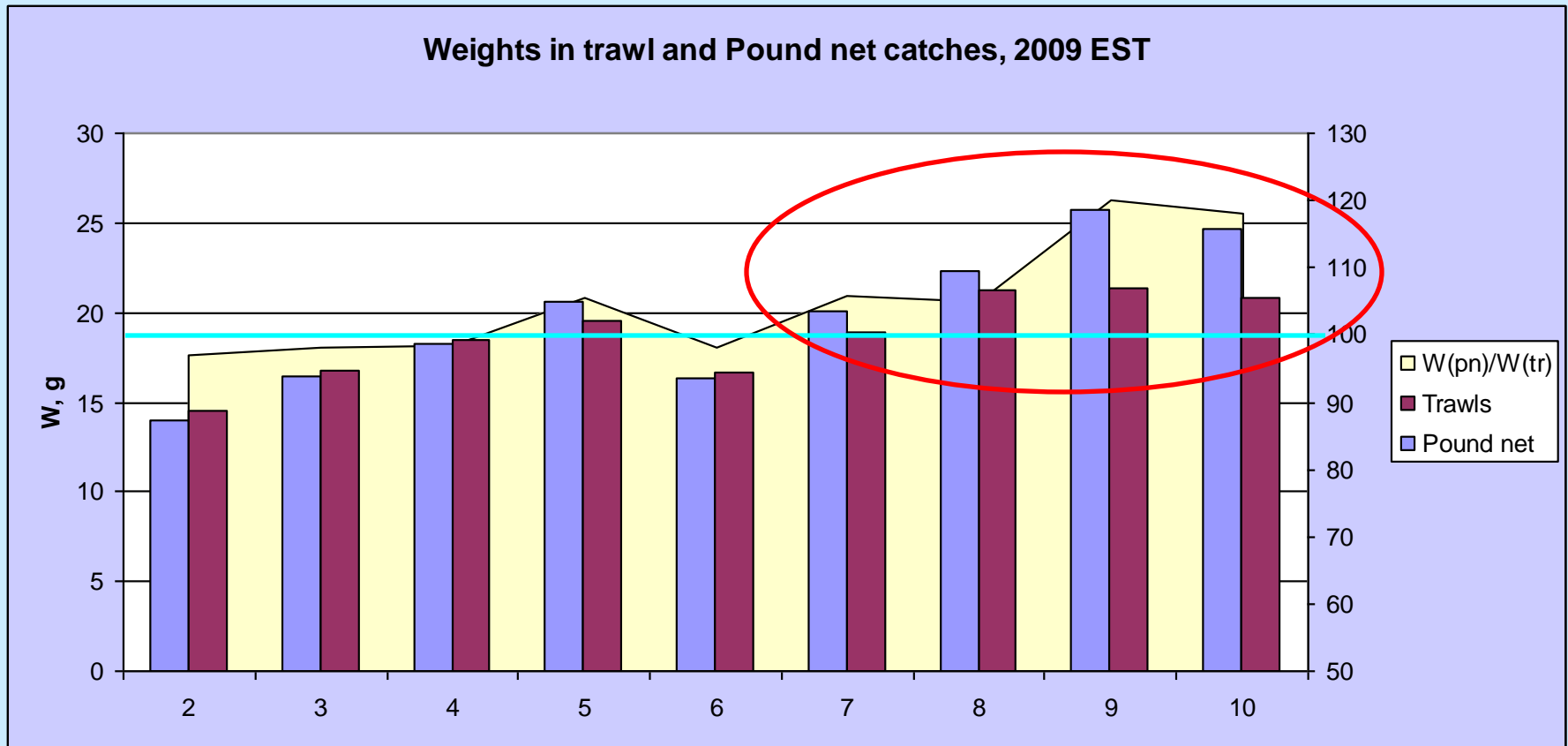
Herring numbers taked in Estonian fishery in Sd 29 and 32 in 1992-2009 and hypothetical gains in numbers if the effort would have been swapped between sub-divisions



Total average gain 104 million

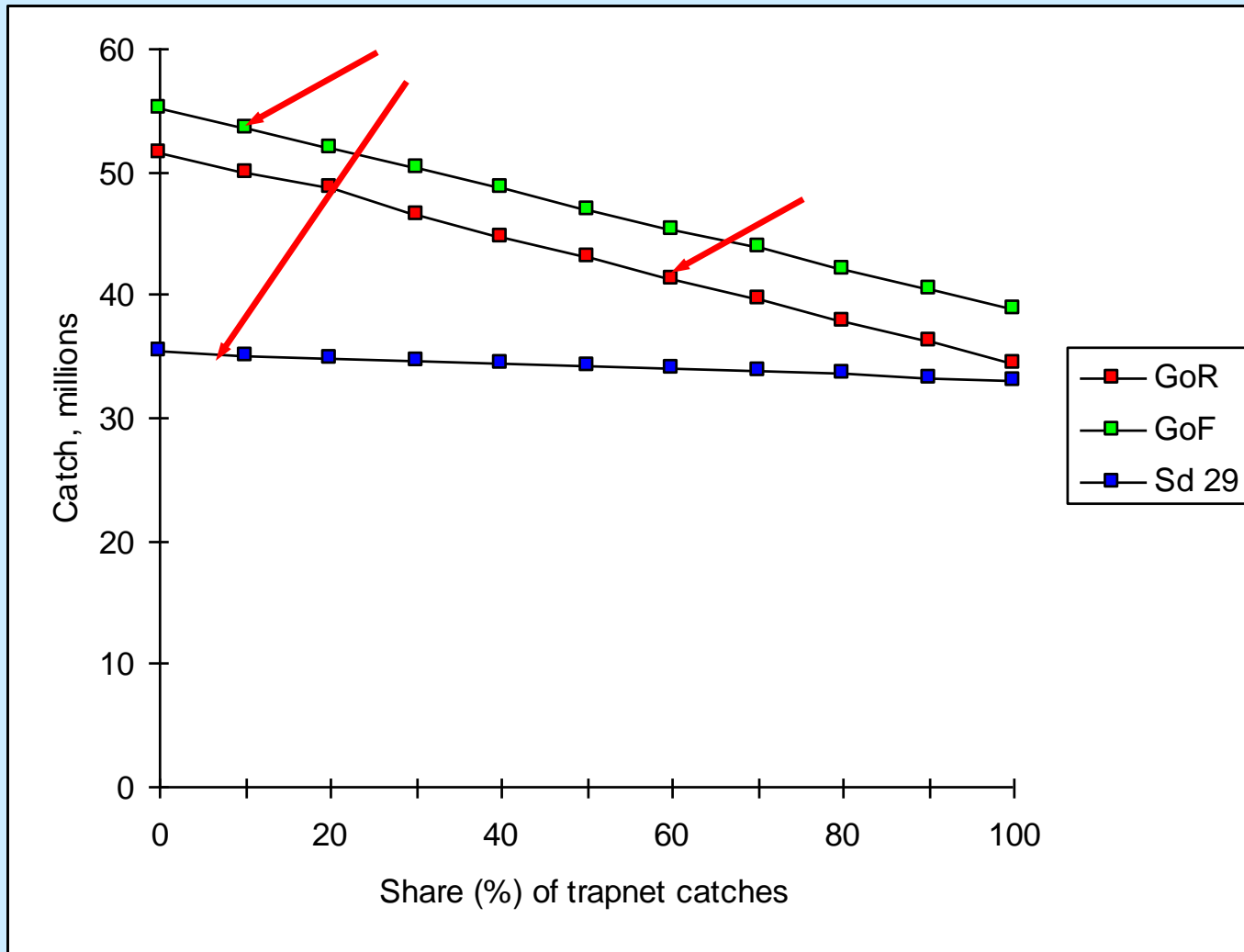
GEAR EFFECT

Gear effect: mean weight at age in trawl and pound net catches in 2009



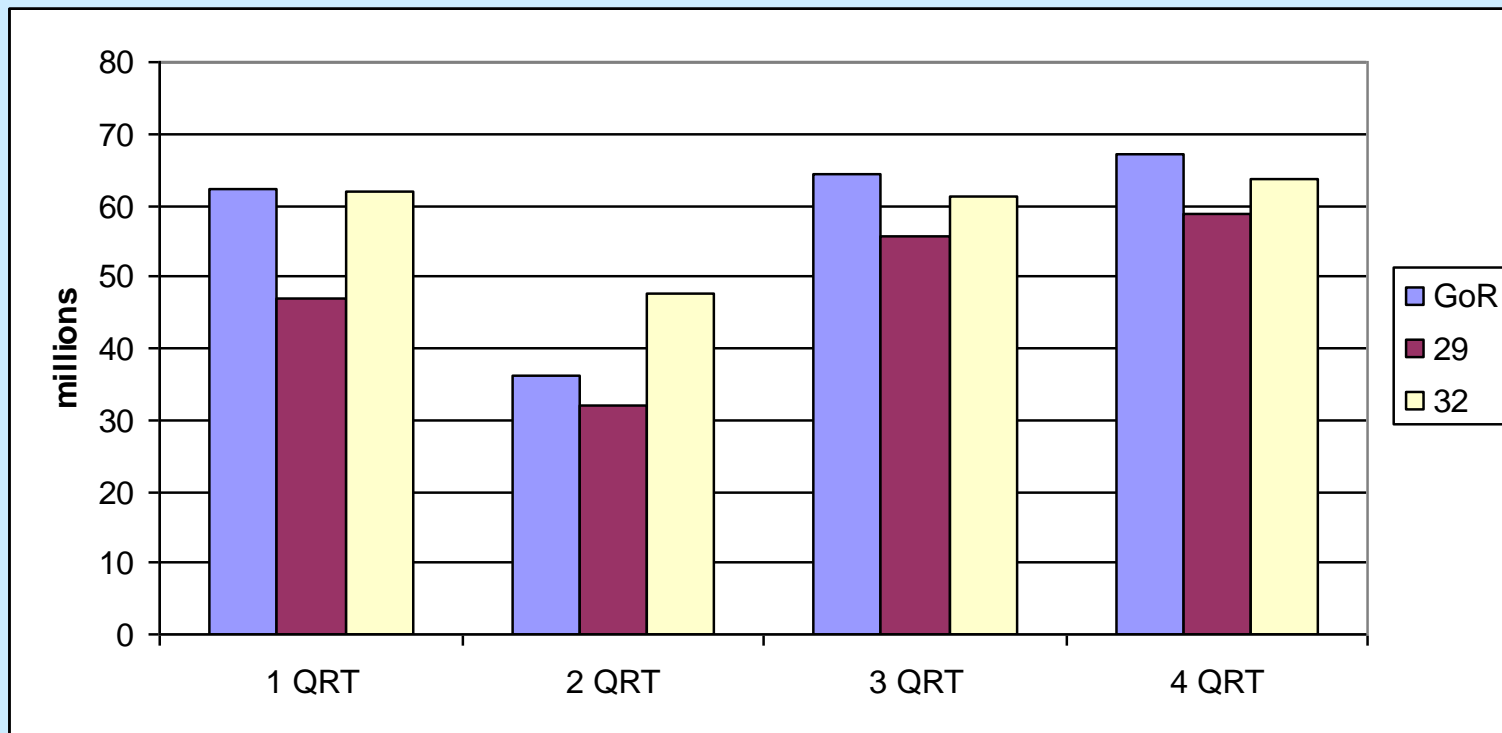
The gear effect can be seen in older age groups only

Catch in millions depending on share of pound net landings in 2nd quarter



The gear effect on CANUM is area-specific

Mean catch of herring by Sub-division and quarter per 1000t in Estonian fishery , 1993-1995



If you want to kill less:

- Fish in 2nd quarter
- Do not fish in 3rd and 4th quarter

Concluding remarks

- Due to geographical heterogeneity of herring the local management of fishery (where and how to take the quota) is of high importance.
- Neglecting the specifics of local populations does not allow to improve the management results

*Thank
you!*



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